

CONTRIBUTIONS TO THE FLORA
OF TROPICAL AMERICA; LXXV¹
A NEW DACRYODES IN TRINIDAD.

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In botanical literature the genus *Dacryodes* has for long been represented in the West Indies by a single species, *D. excelsa* Vahl, which is widely distributed from Puerto Rico to Grenada and is known as "Gommier" or "Bois d'encens" in the Lesser Antilles. For many years, however, I have been aware of the existence in the high forests of the Northern Range of Trinidad of a *Dacryodes* which does not agree with *D. excelsa* because of its more numerous pairs of relatively long and narrow leaflets which are firmly papery or only rather thinly leathery and conspicuously acuminate at the apex. The evidence for this distinct tree was fruiting material collected in the Arima Valley by the late Mr. W. E. Broadway in January, 1925, near the 10½ mile-post on the Blanchisseuse Road, and distributed under the name "*Astronium obliquum* Griseb.?" The tree was noted as of fairly large size, fruiting abundantly, and known as "Incense Tree," but in Trinidad, as elsewhere in the Antilles, the names "Incense" and "Gommier" are often applied to species of the genera *Protium* and *Bursera* in the same family, *Burseraceae*.

Realising the interest of this tree as belonging to a genus and species new to the Trinidad flora, I asked local botanists to look out for further examples in the forests along the Blanchisseuse Road, and to collect flowering material when possible. Nothing further was discovered about the tree until quite recently when the drupes of this very species attracted the notice of the ornithologist, Dr. D. W. Snow, who was collecting and seeking to identify the various fruits and seeds connected with feeding habits of the Oilbird, *Steatornis caripensis* Humboldt, in these forests. When he visited Kew in 1959 to ask about these drupes, which came from a species which he said was one of the common trees above 1500 feet towards the head of the Arima Valley (i.e., on the route of the Blanchisseuse Road), I was able to show him Mr. Broadway's specimens and impressed on him the interest of this tree as an undescribed entity. In April, 1960, Dr. Snow wrote that the *Dacryodes* was fruiting abundantly, and in the same month both he and Mr. R. S. Ayliffe, of the Trinidad Forest Department, made fruiting collections in the Arima valley, the former at 1500 feet, the latter at 9 miles on the Blanchisseuse Road at 1800 feet and thus not far from Mr. Broadway's locality. It was tantalising that flowers were still not collected but, after further appeals to the Trinidad botanists, I at last received excellent fresh flowering specimens (later supplemented by spirit and dried material) which were most kindly sent by air by Mr. R. Nichols. This material had been

¹Continued from Kew Bull. **18**(2): 314. 1965.

²It is with regret we record the sad and unexpected death of Mr. Sandwith which occurred, after a very brief illness, on May 7, 1965.

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collected by Messrs. M. Bhorai and R. Ramkissoon from a single tree with male flowers in forests of the Blanchisseuse Road at 9 miles, and it is clear from the notes that their tree and those of Messrs. Broadway and Ayliffe were within 1-1½ miles of each other, while Dr. Snow's tree was not far distant.

Meanwhile, in 1957 (in "Tropical Woods," no. 106: 46-65), Dr. José Cuatrecasas had published a careful and valuable account of the American species of *Dacryodes* with a distribution map, raising the number of known representatives from 2 (*D. excelsa* and *D. peruviana*) to no less than 15, of which 10 were new species described from single collections scattered over northern South America, from the Pacific coast forests of Colombia and Ecuador to the lower slopes of Mt. Roraima on the Venezuela-British Guiana boundary and the forest reserve at Belém, at the mouth of the Amazons. Some of these specimens were found by him in the covers of others genera of *Burseraceae* in the United States National Herbarium, and I have had a similar experience at Kew.

The distinctions between the taxa recognized by Dr. Cuatrecasas are finely drawn and his key, since "the useful characters for identification are not always present in the specimens," is based mainly on the size, shape and texture of the leaflets and the size of the drupes. He claims that such characters are taxonomically reliable, though often difficult to translate into descriptions, but this claim seems rather naïve when one considers the notorious variability, due to so many causes, in the size, shape and texture of the foliage of different individuals (or even of the same individual) of the same species of large tropical trees, and the fact that most of Dr. Cuatrecasas's species have been described from only one or two gatherings (each of them from a single tree?). A glance at the extensive herbarium material of *D. excelsa* from the West Indies shows a considerable range of variation in the size, shape and texture of the leaflets of that species, and in the length of their acumen: some of the examples with larger, thinner leaflets and a longer acumen were possibly collected from young trees or younger untypical shoots, but there is no evidence of this from notes on the labels. The species are dioecious with unisexual flowers and, up to the present, of the American representatives, presumably only *D. excelsa* is known from collections of flowers of both sexes and of fruits. The inflorescences and small green flowers of these species seem superficially very alike.

I cannot myself fit the Trinidad material into any of the species described by Dr. Cuatrecasas or defined in his key. I think that, on account of the very similar fruits, it comes nearest to *D. excelsa*, which does not reach Trinidad, and to *D. belemensis* Cuatr., of Belém, Pará. It differs from both in the more numerous (usually 4-5) pairs of leaflets, and from *D. excelsa* it further differs in their narrow shape with more numerous main lateral nerves, and in the much shorter pedicels of the flowers, while *D. belemensis* according to the description has more coriaceous and more shortly acuminate leaflets which are puberulous beneath, and narrow drupes. Many of the Kew specimens of *D. excelsa* have very shortly or imperceptibly acuminate leaflets of a much thicker texture than that of the Trinidad tree. Finally, *D. paraensis* Cuatr., from the State of Pará, Brazil, clearly differs from it in the membranous-chartaceous 2-3-jugate leaflets and much smaller fruits;

while *D. glabra* (Steyermark) Cuatr., of the mountains of Estado Bolívar Venezuelan Guiana, is even more distinct on account of its small, ovate or elliptic-ovate, 2-jugate leaflets with less numerous lateral nerves and, again, very small fruits.

This being so, and in sympathy with Dr. Cuatrecasas's apparent hesitation in presenting his synopsis of species (or, should we say, specimens?) of a genus which have been collected, for the most part, in a haphazard way and recognized only long afterwards, I feel little compunction in describing the now well-collected, though still incomplete, material of the Trinidad tree as follows:

Dacryodes trinitensis Sandwith, sp. nov.; *D. excelsae* Vahl affinis, foliolis 3-5-jugis pro rata longis ac angustis saepius tenuioribus atque longius acuminatis, nervis primariis utroque costae laere 10-14-jugis, pedicellis brevioribus differt. *D. belemensis* Cuatr. ex descriptione ob foliola firme coriacea 2-3-juga brevius acuminata subtus plusminusve puberula, necnon drupam angustiore distinguatur.

Arbor satis excelsa, ramulis summis teretibus sulcatis lenticellatis pallide brunneis vel siccitate albo-flavescentibus oculo nudo glabris sed sub lente forti minutissime papilloso-puberulis. *Foliorum* petiolus 2.5-7 (vulgo 4.5-6) cm longus; internodia rhacheos 1.5-4.5 cm longa; petioluli tenues, supra canaliculati, 4-11 mm longi; foliola imparipinnata, 3-5-juga, lanceolata, elliptico-lanceolata, anguste oblongo-elliptica, vel infima nonnunquam ovata et foliolum terminale nonnunquam obovatum vel obovato-ellipticum, apice in acumen apice ipso obtusum 0.8-1.5 cm longum sensim attenuata, basi obliqua cuneatim attenuata vel obtusa vel etiam (praesertim latere superiore) rotundata, 6-14 cm longa, 2-4.7 cm lata (ima foliorum summorum nonnunquam 3-4.5 cm \times 1.4-1.8 cm), glabra, integra, firme chartacea usque satis tenuiter coriacea, costa nervisque primariis utroque ejus latere 10-14 a sese 0.5-1.5 cm (rarius usque 2 cm) sejunctis sursum arcuatis supra subplanis vel prominulis subtus prominentibus, rete venularum intricatissimo utrinque prominulo vel in exemplis coriaceis supra subimmerso ac obscuro. *Inflorescentia* mascula pyramidalis, e basi ramosa, 8-12 cm longa, statu vivo pallide viridis, oculo nudo glabra sed sub lente forti minutissime furfuraceo-puberula; bracteolae ovatae, acutae, circiter 0.75-1 mm longae, 0.75 mm latae; pedicelli circiter 1-2 mm tantum longi. *Flores* masculi tantum visi, virides. *Calyx* leviter cupularis, 1.2 mm altus, 2.5-3 latus, glaber, margine truncato vix sinuato denticulis vix cernendis. *Petala* 3, rarius 4, quam calyx pallidius viridia, ovata, acuta, apice brevissime inflexo leviter cucullata, 2.5 mm longa, 1.8-2.2 mm lata, coriacea, glabra. *Stamina* filamentis 0.5 mm longis glabris; antherae 1 mm longae, circiter 0.5-1 mm latae, apice minute apiculatae. *Ovariodiscus* annulari-conicus vix 1.5 mm altus, sulcatus, basi quinquangulatus fere ad 2 mm latus. *Drupa* ovoideo-ellipsoidea vel ovoidea, 1.8-2.5 cm longa, 1.3-1.6 cm lata, epicarpio in vivo viridi sed siccitate ochraceo-olivaceo vel nigrescente atque more generis nitidulo laxe reticulato-rugoso, maturitate tenui atque facile deterrenti; nucula cum endocarpio corneo, tota 1.7-2.1 cm longa, 1.3-1.4 cm diametro, bilocularis, loculo altero minimo vacuo altero magno seminifero.

TRINIDAD. Northern Range, Arima Valley, Blanchisseuse Road, 9th milepost, in rain forest at 1800 ft, tree 70 ft, fl green, May 25th 1963, M. Bhorai & R. Ramkissoon (field no.

B. 819) in *Trin. Herb.* 18586 (K, holotype); *ibid.*, fr April 5th 1960, R. S. Ayliffe in *Trin. Herb.* 16498 (K); *ibid.*, 10½ mile-post, fr Jan 16th 1925, W. E. Broadway 5525 (K); *ibid.*, forest in 1500 ft, large tree, fr April 1960, D. W. Snow s. n. (K).

The late W. E. Broadway's register of his collections, preserved at Kew, records that a duplicate of his no. 5525 was sent to the British Museum Herbarium.

In my description I have adopted the term *ovariodiscus*, as used by Prof. H. J. Lam in his paper on the morphology of the *Burseraceae*, in *Ann. Jard. Bot. Buitenzorg* 42 (1932), see pp. 129-130 and *tt. xi & xii*, to cover the fusion of the disk with the rudimentary ovary in the male flower.

Dr. Snow succeeded in growing seedlings of this species from seeds dropped by the Oilbirds in the Oilbird cave at 1200 feet in the Arima Valley area. A specimen of these is in the Kew Herbarium, showing an apical pair of opposite trifoliolate leaves about 8 cm long with membranous, lanceolate or elliptic-lanceolate leaflets 3.5-5 × 1.2-1.7 cm and very conspicuously and narrowly acuminate for 1-1.2 cm. The entire plant, about 22 cm high, is pubescent with hairs extending even to the main nerves of the leaflets, and is also clothed with copious reddish brown, sessile glands.

Dacryodes trinitensis features (as *Dacryodes* sp.) as one of the most important food trees of the Oilbird in the Arima Valley in Dr. Snow's recently published paper on the natural history of the Oilbird in Trinidad, Part 2 (Population, Breeding Ecology and Food), in *Zoologica* 47(4): 199-221 (1962). He points out (p. 220) that this species is the "Gommier Montagne" of Dr. J. S. Beard's "The Natural Vegetation of Trinidad" (Oxford Forestry Memoirs, no. 20, 1946). Dr. Beard lists "Gommier Montagne" as "Protium sp., unidentified," a member of the Lower Montane Rain Forest formation, in the *Byrsonima spicata-Licania ternatensis* association (see pp. 33, 114, 120 & 141). Dr. Snow tells me that he knew of one tree growing as low as 500 feet in the Arima Valley. He also found one tree at 1000 feet on the north side of the Northern Range on the Blanchisseuse Road. He adds that, as *Dacryodes* seeds are always found in other Oilbird caves elsewhere in the Northern Range, trees of this species are doubtless widely distributed.

The seeds of the *Dacryodes* are described and figured by Dr. Snow on pp. 208 (Fig. 8) and 209 of his paper. He states that the trees fruited in alternate years in the period of his study (1958-1962): the fruits, borne in large bunches, ripen slowly and irregularly, and it is the non-succulent pericarp with high food-value which attracts the Oilbird and is digested, the seed being regurgitated intact. The bird, he further suggests, is guided to this aromatic tree and to other "spicy" species with suitable fruits by its sense of smell.

I am most indebted to him for the important part he has played in launching *Dacryodes trinitensis*, not merely as a species new to science and to the flora of Trinidad, but as a very interesting tree in the field of general biology.